

MRSA and MSSA Transmission to the Gowns and Gloves of Health Care Workers interacting with Long Term Care Residents

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Updated Abstract

Background:

S. aureus is transmitted through direct or indirect contact in the healthcare setting. Our objective was to estimate the frequency of and risk factors for *S. aureus* transmission to protective gowns and gloves worn by health care workers (HCW) interacting with MRSA and MSSA colonized long term care residents in order to inform infection control policies in this setting.

Methods:

Residents from 14 community-based nursing homes (NH) in Maryland and Michigan were enrolled. Each resident was cultured for *S. aureus* at the anterior nares and perirectal skin. Demographic information and pertinent medical history were collected from the medical record and Minimum Data Set. We then asked HCWs to wear disposable gowns and gloves during a usual care activity (e.g. wound dressing). A research coordinator observed and recorded the type of care delivered with each activity. At the end of each activity, the research coordinator swabbed the HCW's gown and gloves prior to disposing of them.

Results:

We identified 113 residents colonized with MRSA and 59 with MSSA from 401 enrolled residents (Figure 1). We observed an average of 8.5 care activities per resident. Transmission varies by type of care activity from 7% to 37% for gloves and 8% to 27% for gowns. The number and duration of activities did not vary by whether residents were colonized with MRSA or MSSA; however, the common types of care activities did vary by whether residents were colonized with MRSA or MSSA. MRSA colonized residents were significantly older, more likely to be on antibiotics, more likely to have a pressure ulcer, and more likely to have perirectal colonization with *S. aureus* compared with MSSA colonized residents (Table 1). Transmission to both gloves (29% vs 21%, $p<0.01$) and gowns (18% vs 12%, $p<0.01$) was more common during care of MRSA colonized residents as compared with MSSA colonized residents (Figure 3 and 4).

Conclusions:

Gown and glove contamination occurs commonly during resident-HCW interactions in nursing homes. Glove contamination occurs more often than gown contamination. There are high risk and low risk care activities. These are similar for both glove and gown contamination. High risk activities are all high contact activities of daily living and often do not involve overt contact with body secretions. MRSA contamination is more common than MSSA, but MSSA contamination is still substantial particularly for high risk activities.

Background

- S. aureus* is an opportunistic pathogen which causes healthcare associated infections.
- Colonized nursing home residents can be a source of transmission to others.
- Contact with healthcare workers is often the first step in transmission to another resident.
- Patients with MRSA colonization are typically placed in Contact Precautions when hospitalized where as patients with MSSA are not.
- The optional infection control precautions for MRSA in nursing homes is unknown.

Objective

- Estimate the frequency of and risk factors for *S. aureus* transmission to protective gowns and gloves worn by health care workers (HCW) interacting with MRSA and MSSA colonized long term care residents

Methods

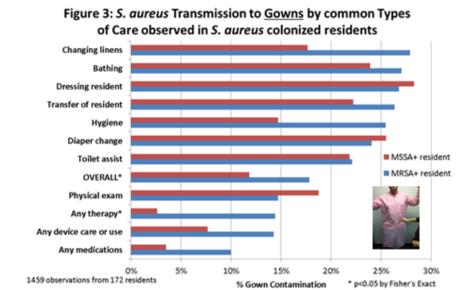
- Residents who were expected to stay at least 1 week were enrolled from 14 community based nursing homes.
- Each resident was cultured for *S. aureus* at the anterior nares and perirectal skin.
- Demographic and pertinent medical history were collected from the medical record and Minimum Data Set.
- HCW's wore disposable gown and gloves during interactions in which residents received their usual care.
- A research coordinator observed and recorded the type(s) of care with each interaction.
- At the end of the interaction, the research coordinator swabbed the HCW's gown and gloves.
- Gowns and gloves were then cultured for *S. aureus* to assess if *S. aureus* was transmitted during the interaction.



Results, cont.

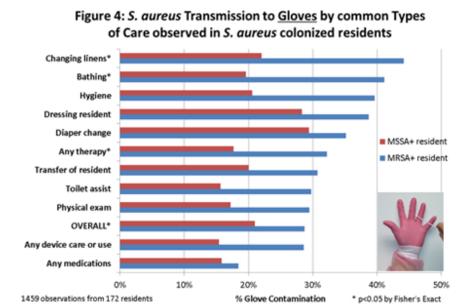
High risk activities for Gown contamination with *S. aureus*:

- Dressing
- Bathing
- Transfer
- Diaper change
- Linen change
- Toilet assist
- Hygiene



High risk activities for Glove contamination with *S. aureus*:

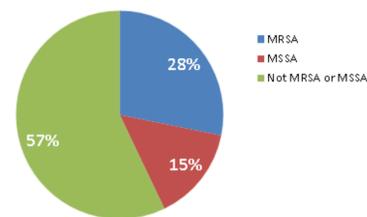
- Dressing
- Dressing Change
- Diaper change
- Linen change
- Toilet assist
- Hygiene



OR >1.0, $p< 0.05$ by GEE

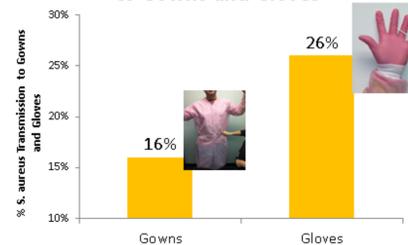
Results

Figure 1: *S. aureus* Colonization Status Enrolled Residents (n=401)



From 401 enrolled residents, 113 (28%) residents were colonized with MRSA and 59 (15%) with MSSA.

Figure 2: Overall *S. aureus* Transmission to Gowns and Gloves



From 1459 interactions with 172 residents with *S. aureus* colonization, 16% of gowns and 26% of gloves were contaminated with *S. aureus*.

Table 1: Key differences in Residents colonized with MRSA vs. MSSA

	MRSA Residents n=113	MSSA Residents n=59	p-value
Age in years	80 ± 10	75 ± 11	<0.01
Receiving Rehabilitation	56 (50)	39 (66)	0.04
Current Antibiotic Use	14 (12)	2 (3)	0.05
Pressure Ulcer	24 (21)	6 (10)	0.08
Perirectal colonization with <i>S. aureus</i>	44 (39)	8 (14)	<0.01

Conclusions

- Gown and glove contamination occurs commonly during resident-HCW interactions in nursing homes. Glove contamination occurs more often than gown contamination.
- There are high risk and low risk care activities. These are similar for both glove and gown contamination. High risk activities are all high contact activities of daily living and often do not involve overt contact with body secretions.
- MRSA contamination is more common than MSSA, but MSSA contamination is still substantial particularly for high risk activities.
- These results can help prioritize the use of gowns and gloves in nursing homes to prevent MRSA and MSSA transmission.

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